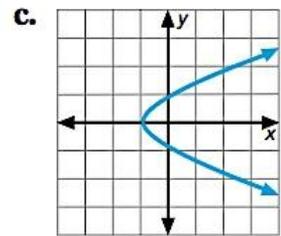
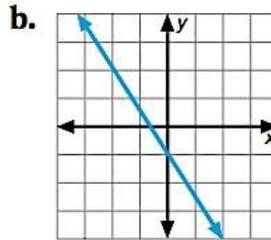
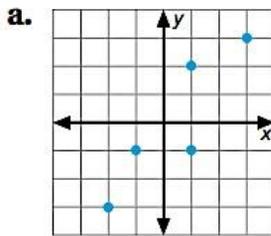


You can tell whether a graphed relation is a **function** by using the **vertical line test**. Visualize a vertical line that moves left to right through the coordinate plane. If the vertical line ever intersects the plotted graph in more than one point, then the relation is *not* a function.

Use the vertical line test to determine if each relation is a function.



The description of a function is a **function rule**. For example, if x is the domain, then the *add 5 rule* becomes $x+5$. A symbol like $f(x)$ or $g(x)$ denotes the range assigned to x . The function is written $f(x) = x+5$, and the ordered pair is $(x, f(x))$.

The function $f(x) = x+5$ is read “f of x equals x plus five”. To evaluate a function at a given value of the domain, substitute the value into the function.

Example: If $x = 1$ then $f(1) = 1 + 5$, or 6

If $x = 4$ then $f(4) = 4 + 5$, or 9.

A **linear function** is a function that can be represented on a graph by a straight line.

Make a table of three solutions for each equation below. Then graph the equation.

$$y = 3x$$

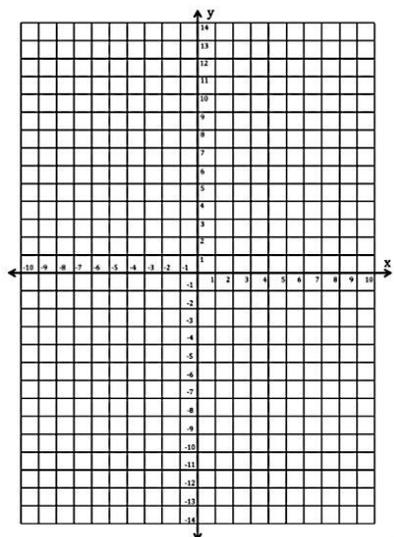
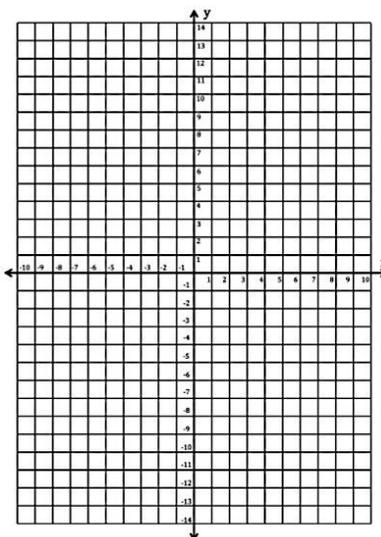
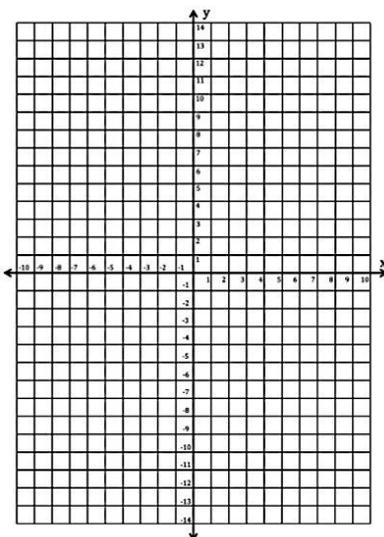
$$y = \frac{1}{2}x$$

$$y = -3x - 2$$

x	y	(x, y)

x	y	(x, y)

x	y	(x, y)



A **linear equation** in two variables is an equation in which the variables appear in separate terms and neither variable contains an exponent other than 1.

Examples: $y = 3x + 2$, $\frac{2}{3}x - 4y = 16$, $y = -2x$

Non-Examples: $y = x^2$, $xy - 1 = 0$, $y = 2x^2 + 7x + 3$

Linear equations are easiest to graph when they are written in **slope-intercept form**: $y = mx + b$ where x and y are variables and m and b are constants.

The solutions to a linear equation are written as ordered pairs. To determine solutions of an equation with two variables, first choose any value for the first variable, x .

Then substitute that value into the equation for x and solve to find the corresponding value of y . Do this for at least three different values of x . Make a table to organize the ordered pairs that are solutions of the equation.

Let's take a look at a real world problem:

Ava sets a goal to read twelve books over summer vacation. Ava expects to read two books each week. How many weeks will it take Ava to reach her goal?

x (weeks)	y (books left to reach goal)	(x, y)

